AMENDMENTS TO THE CLAIMS

Claim 1 (Currently Amended) An optimization method for optimizing an order of component mounting in a component mounting system having a plurality of mounters for mounting components ~~on~~ onto a board,

wherein each of the mounters includes a respective component supply unit and a respective placement head for picking up components from the respective component supply unit and for mounting the picked-up components onto the board,

wherein the mounters are for mounting components onto the board according to (i) component placement patterns of the board or (ii) groups of component placement patterns of the board,

wherein each of the component patterns or groups of component placement patterns identifies a specific mounting arrangement of specific components to be mounted onto the board, and

wherein the board is transported from a first mounter located upstream to a second mounter located downstream, such that the components are mounted onto the board in an order starting from the first mounter and continuing to the second mounter,

~~wherein a plurality of patterns having the same component placement structure is included in the board, and~~

~~the optimization method comprises an allocation step of~~

the optimization method comprising:

respectively allocating components[[,]] to each of the mounters ~~plurality of,~~ on one of a (i) ~~a~~ per component placement pattern basis and ~~or~~ (ii) per group of component placement patterns ~~pattern group~~ basis ~~which is made up of a plurality of patterns~~, such that, during the transporting of the board, each of the mounters mounts every component of a respective component placement pattern or a respective group of component placement patterns.

Claim 2 (Currently Amended) The optimization method according to Claim 1, further comprising ~~comprises a step of~~ optimizing the order of component mounting for any one

component placement pattern among ~~the~~ a plurality of component patterns.

Claim 3 (Currently Amended) The optimization method according to Claim 1, wherein the respectively allocating of the components further comprises: ~~allocation step includes:~~

~~a pattern number determination step of~~ determining, from (i) a total number of ~~the~~ component placement patterns ~~included in~~ of the board and (ii) a number of ~~the~~ available mounters in the component mounting system, a number of respective component placement patterns to be allocated to each respective mounter ~~of the mounters~~ so that the number of respective component placement patterns allocated to each respective mounter is approximately the same ~~even~~; and

~~a pattern allocation step of~~ allocating the ~~determined~~ number of respective component placement patterns determined by the determining of the number of respective component placement patterns to any of the plurality of mounters for component mounting.

Claim 4 (Currently Amended) The optimization method according to Claim 3, wherein the determining of the ~~pattern~~ number of respective component placement patterns further comprises: ~~determination step includes~~:

~~a step of~~ calculating a quotient and a remainder by dividing the total number of ~~the~~ component placement patterns ~~included in~~ of the board by the number of available mounters;

~~a step of~~ determining the quotient as the number of respective component placement patterns to be allocated to each respective mounter, in ~~the~~ a case where the remainder is zero; and

~~a step of i)~~ in a case where the remainder is one or greater, (i) determining a number, which is the quotient plus one, as the number of component placement patterns to be allocated to ~~the same~~ a number of mounters ~~as~~ equal to the remainder, starting from the first mounter ~~in a process farthest upstream, and ii)~~, and (ii) determining the quotient as the number of component placement patterns to be allocated to ~~the rest of the~~ mounters not having the quotient plus one as the number of component placement patterns allocated thereto~~, in the case where the remainder is one or greater~~.

Claim 5 (Currently Amended) The optimization method according to Claim 3, wherein the determining of the ~~pattern~~ number of respective component placement patterns further comprises: ~~determination step includes:~~

~~a step of~~ calculating a quotient and a remainder by dividing the total number of ~~the~~ component placement patterns ~~included in~~ of the board by the number of available mounters; and

~~a first allocation sub-step of~~ first determining the quotient as the number of respective component placement patterns to be allocated to each respective mounter ~~of the mounters~~.

Claim 6 (Currently Amended) The optimization method according to Claim 5, wherein the determining of the ~~pattern~~ number of respective component placement patterns further comprises ~~determination step further includes a second allocation sub-step of~~ second determining the remainder as ~~the~~ a number of component placement patterns to be commonly allocated among ~~to~~ the plurality of mounters.

Claim 7 (Currently Amended) The optimization method according to Claim 6, wherein, in the second determining ~~in the second allocation sub-step~~, the number of component placement patterns to be commonly allocated to the plurality of mounters is determined so that a time for component mounting for each of the mounters is approximately the same ~~even~~.

Claim 8 (Currently Amended) The optimization method according to Claim 6, wherein, in the allocating of the number of respective component patterns ~~pattern allocation step~~, the component placement patterns to be commonly allocated to the plurality of mounters are located in positions ~~in~~ on the board ~~on~~ at which components can be mounted by ~~said~~ the plurality of mounters.

Claim 9 (Currently Amended) The optimization method according to Claim 6, wherein the plurality of mounters ~~is~~ includes all of the mounters included in the component mounting system.

Claim 10 (Currently Amended) The optimization method according to Claim 3, wherein, in

the allocating of the number of respective component placement patterns ~~pattern allocation step~~, the determined number of respective component placement patterns are allocated to each respective mounter ~~of the mounters, as the patterns~~ based on which components are to be mounted, so that borders between the determined number of respective component placement patterns allocated to each respective mounter ~~of the mounters~~ are set orthogonally to a direction in which the board moves through the component mounting system.

Claim 11 (Currently Amended) The optimization method according to Claim 1[[,]] further ~~comprises a step of~~ comprising determining a position of the board during component mounting so that a moving distance, from a default position to ~~the~~ an allocated pattern, of a head of each of the mounters is uniform for all of ~~said~~ the mounters, the head being used for mounting components onto ~~on~~ the board.

Claim 12 (Currently Amended) The optimization method according to Claim 1[[,]] further ~~comprises a step of~~ comprising determining placement positions of component cassettes used in component mounting so that a distance from the placement positions of the component cassettes to ~~the~~ an allocated pattern, for each of the mounters is uniform ~~for all of said mounters~~.

Claim 13 (Cancelled)

Claim 14 (Currently Amended) A computer-readable recording medium ~~on which~~ having a computer program recorded thereon, the computer program for optimizing an order of component mounting in a component mounting system ~~is recorded, the component mounting system~~ having a plurality of mounters for mounting components onto ~~on~~ a board,

wherein each of the mounters includes a respective component supply unit and a respective placement head for picking up components from the respective component supply unit and for mounting the picked-up components onto the board,

wherein the mounters are for mounting components onto the board according to (i) component placement patterns of the board or (ii) groups of component placement patterns of the

board,

wherein each of the component pattern or groups of component placement patterns identifies a specific mounting arrangement of specific components to be mounted onto the board, and

wherein the board is transported from a first mounter located upstream to a second mounter located downstream, such that the components are mounted onto the board in an order starting from the first mounter and continuing to the second mounter,

the computer program causing a computer to execute an optimization method comprising:

~~wherein a plurality of patterns having the same component placement structure is included in the board, and~~

~~the program causing a computer to execute an allocation step of~~ respectively allocating components[[,]] to each of the mounters ~~plurality of,~~ on one of a (i) per component placement pattern basis ~~or~~ (ii) per group of component placement patterns basis ~~pattern group which is made up of a plurality of patterns~~, such that, during the transporting of the board, each of the mounters mounts every component of a respective component placement pattern or a respective group of component placement patterns.

Claim 15 (Currently Amended) A mounter for mounting components on a board according to a mounting order optimized through an optimization method for optimizing an order of component mounting in a component mounting system having a plurality of mounters for mounting components ~~on~~ onto a board, the mounter comprising:

a component supply unit; and

a placement head operable to pick up components from the component supply unit and operable to mount the picked-up components onto the board,

wherein the mounter mounts the components onto the board according to (i) component placement patterns of the board or (ii) groups of component placement patterns of the board, and

wherein each of the component patterns or groups of component placement patterns identifies a specific mounting arrangement of specific components to be mounted onto the board,

wherein the board is transported from a first mounter located upstream to a second mounter located downstream, such that the components are mounted onto the board in an order starting from the first mounter and continuing to the second mounter, and

~~wherein a plurality of patterns having the same component placement structure is included in the board, and~~

wherein the optimization method includes ~~an allocation step of~~respectively allocating components[[,]] to each of the mounters ~~plurality of,~~ on one of a (i) per component placement pattern basis and ~~or~~ (ii) per group of component placement patterns basis ~~pattern group which is made up of a plurality of patterns~~, such that, during the transporting of the board, each of the mounters mounts every component of a respective component placement pattern or a respective group of component placement patterns.

Claim 16 (Currently Amended) An optimization apparatus for optimizing an order of component mounting in a component mounting system having a plurality of mounters for mounting components ~~on~~ onto a board,

wherein each of the mounters includes a respective component supply unit and a respective placement head for picking up components from the respective component supply unit and for mounting the picked-up components onto the board,

wherein the mounters are for mounting components onto the board according to (i) component placement patterns of the board or (ii) groups of component placement patterns of the board,

wherein each of the component pattern or groups of component placement patterns identifies a specific mounting arrangement of specific components to be mounted onto the board, and

wherein the board is transported through the component mounting system from a first mounter located upstream to a second mounter located downstream, such that the components are mounted onto the board in an order starting from the first mounter and continuing to the second mounter,

~~wherein a plurality of patterns having the same component placement structure is~~

~~included in the board, and~~

the optimization apparatus comprising: ~~comprises:~~

_____an optimizing unit operable to optimize the order of component mounting for any one component mounting pattern among the plurality of component mounting patterns; and

_____an allocating unit operable to respectively allocate components[[,]] to each of the mounters ~~plurality of mounters,~~ on one of a (i) per component placement pattern basis and ~~or~~ (ii) per group of component placement patterns basis ~~pattern group which is made up of a plurality of patterns~~, such that, during the transporting of the board, each of the mounters mounts every component of a respective component placement pattern or a respective group of component placement patterns.